Zika

DISEASE REPORTABLE WITHIN 24 HOURS OF DIAGNOSIS

Per N.J.A.C. 8:57, healthcare providers and administrators shall report by mail or by electronic reporting within 24 hours of diagnosis, confirmed cases of Zika to the health officer of the jurisdiction where the ill or infected person lives, or if unknown, wherein the diagnosis is made. A directory of local health departments in New Jersey is available at http://localhealth.nj.gov.

If the health officer is unavailable, the healthcare provider or administrator shall make the report to the Department by telephone to 609-826-5964 between 8:00A.M. and 5:00 P.M. on non-holiday weekdays or to 609-392-2020 during all other days and hours.

NJ Health
New Jersey Department of Health

April 28, 2021

1 THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Zika virus (ZIKV) is a single-stranded RNA virus of the *Flaviviridae* family in the genus *Flavivirus; it* is closely related to dengue, yellow fever, Japanese encephalitis, and West Nile viruses.

B. Clinical Description

Most Zika infections are asymptomatic or have only mild symptoms lasting several days to one week. The most common symptoms are: fever, rash, arthralgia (joint pain), conjunctivitis (red eyes), headache, and muscle pain. Research suggests that Guillain-Barré syndrome (GBS) is strongly linked to Zika; however, only a small proportion of people with a recent Zika infection develop GBS. GBS is a neurological disorder causing muscle weakness and sometimes, paralysis.

Zika infection during pregnancy is a cause of congenital microcephaly and other severe brain abnormalities. Zika virus has also been linked to miscarriage, stillbirth, and other birth defects. In 2016, approximately one in 10 pregnancies with laboratory-confirmed Zika infection resulted in a fetus or infant with Zika–associated birth defects. The Centers for Disease Control and Prevention (CDC) has identified a distinct pattern of birth defects called Congenital Zika Syndrome (CZS) found after Zika virus infection during pregnancy. CZS is associated with five types of birth defects that are either not seen or occur rarely with other infections (e.g., cytomegalovirus or rubella) during pregnancy:

1. Severe microcephaly resulting in a partially collapsed skull
2. Decreased brain tissue with a specific pattern of brain damage, including subcortical calcifications
3. Damage to the back of the eye, including macular scarring and focal retinal pigmentary mottling
4. Congenital contractures, such as clubfoot or arthrogryposis
5. Hypertonia restricting body movement soon after birth

Infants and children can acquire Zika virus postnatally via other routes of transmission, such as mosquito bites. Information on long-term outcomes among infants and children with postnatal Zika virus disease is limited though most children infected with Zika virus are asymptomatic or have mild illness.

C. Reservoirs

Zika is maintained in enzootic transmission cycles between non-human primates and mosquitoes in forested areas of Africa, Asia, and South America. In urban and suburban areas however, Zika is transmitted between people by *Aedes* mosquitoes, especially *Ae. aegypti* (the main vector worldwide) and potentially *Ae. albopictus*.

Mosquitoes that transmit Zika are present in the United States. *A. aegypti* is present throughout southern Florida, southern Louisiana, parts of New Mexico and Arizona, southern and central Texas, and have recently been detected in central California and southern Utah. *Ae. albopictus* is widely present throughout most of the southern United States and as far north as Illinois and New York, including in New Jersey. *Ae. aegypti* is not an established vector in NJ, but *Ae. albopictus* is found in most areas of the state.

D. Modes of Transmission

Primary mode of transmission: Zika is transmitted to humans primarily through the bite of an infected *Aedes* species mosquito. *Ae. aegypti* mosquitoes live in tropical, subtropical, and in some temperate climates and are the primary vector of Zika, dengue, chikungunya, and other arboviral diseases. Because *Ae. aegypti* mosquitoes live near and prefer to feed on people, they are considered highly efficient at spreading these diseases. *Ae. albopictus* mosquitoes live in tropical, subtropical, and temperate climates. Because these mosquitoes feed on people and animals, they are less likely to spread these viruses. These mosquitoes bite during the day and night, but usually do not live at elevations above 6,500 feet (2,000 meters).

Additional modes of transmission:

- **Zika can be transmitted from an infected pregnant woman to her fetus.** Zika is a cause of microcephaly and other severe fetal brain defects. According to CDC, about 2 in 20 (10%) babies of women with confirmed Zika virus infection during pregnancy in US states and about 1 in 20 (5%) in US territories had Zika-associated birth defects. Birth defects were reported in a higher proportion of babies whose mothers were infected with Zika virus during the first trimester (first three months) of pregnancy. Some babies with possible Zika infection during pregnancy might look healthy at birth but can develop long-term health problems as they grow.
- **A pregnant woman already infected with Zika virus can pass the virus to her fetus during pregnancy or around the time of birth.** In addition, Zika virus has been found in breast milk. Possible Zika virus infections have been identified in breastfeeding babies, but Zika virus transmission through breast milk has not been confirmed. Because current evidence suggests that the benefits of breastfeeding outweigh the risk of Zika virus spreading through breast milk, CDC continues to encourage mothers to breastfeed, even if they were infected or lived in or traveled to an area with risk of Zika.
- **Zika virus can be transmitted from an infected sexual partner during unprotected oral, anal, or vaginal sexual activity, whether or not the infected person has symptoms of Zika.** There is documented evidence of sexual transmission of Zika from male-to-female, male-to-male, and female-to-male sex partners. Female-to-female sexual transmission has not yet been reported but is biologically plausible. Current research indicates that Zika virus can remain in semen longer than in other body fluids, including vaginal fluids, urine, and blood. There is no evidence to suggest that Zika virus can be passed through saliva during kissing.
- **Zika may also be transmitted via organ transplantation and blood transfusions from infected donors.** To date, there have not been any confirmed blood transfusion

transmission cases in the United States, however there have been multiple reports of possible blood transfusion transmission cases in other areas of the world.

- **Zika may be transmitted through healthcare and laboratory exposures.** There have been reported laboratory-acquired infections, but the route of transmission was not clearly established in all cases. To date, no cases of Zika virus transmission in healthcare settings have been identified in the United States.
- **There is limited information available about the risk of peri-conceptional Zika infection (defined as infection during 8 weeks before conception or 6 weeks before last menstrual period).** There is no evidence that a fetus conceived after the virus has cleared the woman's body would be at risk for fetal Zika infection. Current evidence suggests that Zika virus infection prior to pregnancy would not pose a risk of birth defects to a future pregnancy. From what we know about similar infections, once a person has been infected with Zika virus, he or she is likely to be protected from a future Zika infection. Currently, we do not have a test to tell if someone is protected against Zika virus.

E. Incubation Period

3-14 days

F. Period of Communicability or Infectious Period

Viremia is expected to occur from several days before until a week after illness onset. During this time, the infected person could be a source of exposure through percutaneous transmission or through a mosquito bite. It is unknown how long the virus persists in semen and vaginal fluids, but among published reports, infectious Zika virus can be detected in semen 38 days after the onset of symptoms[1], and confirmed viral RNA detectable in semen 370 days after onset[2,3]. Zika virus RNA was found in colostrum and breast milk 33 days after onset and 9 days after delivery[4].

Based on the available evidence, Zika virus infection in a woman who is not pregnant would not pose a risk for birth defects in future pregnancies after the virus has cleared from her blood.

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[1] Paz-Bailey G, Rosenberg ES, Doyle K, et al. Persistence of Zika Virus in Body Fluids – Final Report. New England Journal of Medicine2018; 379:1234-1243. https://www.nejm.org/doi/full/10.1056/NEJMoa1613108

[2] Freddy A Medina, Giselle Torres, Jenny Acevedo, Sharon Fonseca, Leslie Casiano, Carlos M De León-Rodríguez, Gilberto A Santiago, Katherine Doyle, Tyler M Sharp, Luisa I Alvarado, Gabriela Paz-Bailey, Jorge L Muñoz-Jordán, Duration of the Presence of Infectious Zika Virus in Semen and Serum, The Journal of Infectious Diseases, Volume 219, Issue 1, 1 January 2019, Pages 31–40, https://doi.org/10.1093/infdis/jiy462

[3] Luisa Barzon, Elena Percivalle, Monia Pacenti, Francesca Rovida, Maurizio Zavattoni, Paola Del Bravo, Anna Maria Cattelan, Giorgio Palù, Fausto Baldanti, Virus and Antibody Dynamics in Travelers With Acute Zika Virus Infection, Clinical Infectious Diseases, Volume 66, Issue 8, 15 April 2018, Pages 1173–1180, https://doi.org/10.1093/cid/cix967

[4] Sotelo JR, Sotela AB, Soleto FJ, et al. Emerging Infectious Diseases, Vol 23 No. 5., May 2017. Persistence of Zika Virus in Breast Milk after Infection in Late Stage Pregnancy. https://wwwnc.cdc.gov/eid/article/23/5/16-1538_article

G. Epidemiology

Zika was first identified in the Zika Forest of Uganda in 1947. Before 2007, at least 14 human cases of Zika had been documented. In 2007, an outbreak of Zika occurred on Yap Island, Federated States of Micronesia and the ensuing investigation included the first population-based epidemiological study of Zika infection and disease. It was estimated that 75% (attack rate) of the island's inhabitants were infected with Zika resulting in 18% symptomatic and 82% asymptomatic infections. From 2013 to 2014 there was a large outbreak in French Polynesia where possible associations between Zika and congenital malformations and severe neurological and autoimmune complications were noted. By 2015, Zika outbreaks had occurred in areas of Africa, Southeast Asia, and the Pacific Islands. Because the symptoms of Zika are similar to many other diseases, cases may have been unrecognized.

Zika emerged in the Region of the Americas on Easter Island, Chile, in 2014 and in northeast Brazil in 2015. Brazilian investigators reported an increase in Guillain-Barré syndrome (GBS) and identified an association between Zika infection during pregnancy and congenital microcephaly. On February 1, 2016, WHO declared Zika–related microcephaly clusters and other neurologic disorders a Public Health Emergency of International Concern.

The number of countries and territories in the Americas reporting Zika cases increased to 48 by late 2016. Several factors might have contributed to this rapid spread. The absence of previous reports of Zika outbreaks in the region suggests that populations were immunologically naïve. The presence of *Ae. aegypti* mosquitoes in most countries facilitated widespread establishment of local transmission. In addition, high levels of travel within the region might have promoted spread to previously unaffected areas.

After reporting high numbers of Zika cases during the first half of 2016, incidence in all subregions declined. Reasons for the decline might include the reduction in the number of susceptible persons and seasonal or meteorologic changes, especially in areas with a nontropical climate, leading to lower density of *Ae. aegypti*. On November 18, 2016, WHO declared that Zika and associated complications remain a considerable public health challenge requiring long-term coordinated action, but no longer represent a Public Health Emergency of International Concern.

The majority of Zika cases reported in the continental US were acquired elsewhere by travelers or immigrants. Local mosquito-borne transmission was initially reported in Florida (July 2016) and Texas (November 2016). CDC advises pregnant women not to travel to any area where there is a risk of Zika infection (https://wwwnc.cdc.gov/travel/page/world-map-areas-with-zika).

Since the Zika outbreaks of 2016, reported Zika cases in the Americas have declined by 30-70 fold and are now outnumbered by reported dengue cases by a ratio of approximately 200:1. As of January 2021, the last laboratory confirmed cases of locally-acquired Zika in the continental United States and the U.S. Territories were in September 2017 and May 2018, respectively.

2 CASE DEFINITION

The NJDOH Infectious & Zoonotic Disease Program follows the most current Zika case definition as published on the CDC National Notifiable Disease Surveillance System (NNDSS) website.

Zika Case Definition: https://wwwn.cdc.gov/nndss/conditions/zika/

Case definitions enable public health to classify and count cases consistently across reporting jurisdictions, and should not be used by healthcare providers to determine how to meet an individual patient's health needs.

The June 2016 case definition includes four subgroups, which differ by the presence of symptoms and whether infection is congenital:

Zika virus disease, congenital	Zika virus disease, non-congenital
Zika virus infection, congenital	Zika virus infection, non-congenital

LABORATORY CRITERIA:

Recent ZIKV infection

- Culture of ZIKV from blood, body fluid, or tissue; OR
- Detection of ZIKV antigen or RNA in serum, cerebrospinal fluid (CSF), placenta, umbilical cord, fetal tissue, or other specimen (e.g., amniotic fluid, urine, semen, saliva), OR
- Positive IgM antibody test in serum or CSF with positive ZIKV neutralizing antibody titers and negative neutralizing antibody titers against dengue or other endemic flaviviruses

Recent flavivirus infection, possible ZIKV

- Positive IgM antibody test of serum or CSF with positive neutralizing antibody titers against ZIKV and dengue virus or other endemic flaviviruses
- Positive ZIKV IgM antibody test AND negative dengue virus IgM antibody test with no neutralizing antibody testing performed

EPIDEMIOLOGIC LINKAGE:

- Resides in or recent travel to an area with known ZIKV transmission; OR
- Sexual contact with a confirmed or probable case within the transmission risk window of ZIKV infection or person with recent travel to an area with known ZIKV transmission; OR
- Receipt of blood or blood products within 30 days of symptom onset; OR
- Organ or tissue transplant recipient within 30 days of symptom onset; OR
- Association in time and place with a confirmed or probable case; OR
- Likely vector exposure in an area with suitable seasonal and ecological conditions for potential local vector-borne transmission

SUBGROUP - ZIKA VIRUS DISEASE, CONGENITAL

Clinical criteria: Liveborn infant with congenital microcephaly, intracranial calcifications, structural brain or eye abnormalities, or other congenital central nervous system-related abnormalities not explained by another etiology

Case Classification

Probable

- A neonate meets clinical criteria for congenital disease; **AND**
- The neonate's mother has an epidemiologic linkage or meets laboratory criteria; **AND**
- The neonate has laboratory evidence of ZIKV or flavivirus infection by:
    - Positive ZIKV IgM antibody test of serum or CSF collected within 2 days of birth; **AND**
        - positive neutralizing antibody titers against ZIKV and dengue or other flaviviruses endemic to the region where exposure occurred[5]; **OR**
        - negative dengue virus IgM antibody test and no neutralizing antibody testing performed.

Confirmed

- A neonate meets the clinical criteria for congenital disease AND meets one of the following laboratory criteria:
    - ZIKV detection by culture, viral antigen, or viral RNA in fetal tissue or amniotic fluid; or neonatal serum, CSF, or urine collected within 2 days of birth; OR
    - Positive ZIKV IgM antibody test of neonatal serum or CSF collected within 2 days of birth with positive ZIKV neutralizing antibody titers and negative neutralizing antibody titers against dengue or other flaviviruses endemic to the region where exposure occurred[1].

SUBGROUP - ZIKA VIRUS INFECTION, CONGENITAL

Same as Zika Virus Disease, Congenital, EXCEPT that neonate DOES NOT MEET clinical criteria for congenital disease.

SUBGROUP – ZIKA VIRUS DISEASE, NON-CONGENITAL

Clinical criteria: A person with one or more of the following not explained by another etiology:

- Clinically compatible illness that includes
    - acute onset of fever (measured or reported), OR

[5] For congenital cases, PRNT is needed for either the mother's OR infant's specimen. PRNT includes IgG antibodies, which cross the placenta.

  - maculopapular rash, OR
  - arthralgia, OR
  - conjunctivitis

- Complication of pregnancy
  - fetal loss; OR
  - fetus or neonate with congenital microcephaly, intracranial calcifications, other structural brain or eye abnormalities, or other congenital central nervous system-related abnormalities including defects such as clubfoot/multiple joint contractures

- Guillain-Barré syndrome or other neurologic manifestations

Case Classification

Probable

- Meets clinical criteria for non-congenital disease; **AND**
- Has an epidemiologic linkage; **AND**
- Has laboratory evidence of recent ZIKV or flavivirus infection by:
  - Positive ZIKV IgM antibody test of serum or CSF with:
    - positive neutralizing antibody titers against ZIKV and dengue or other endemic flaviviruses; **OR**
    - negative dengue IgM antibody test and no neutralizing antibody testing.

Confirmed

- Meets clinical criteria for non-congenital disease; AND
- Has laboratory evidence of recent ZIKV infection by:
  - Detection of ZIKV by culture, viral antigen or viral RNA in serum, CSF, tissue, or other specimen (e.g. amniotic fluid, urine, semen, saliva); OR
  - Positive ZIKV IgM antibody test of serum or CSF with positive ZIKV neutralizing antibody titers and negative titers against dengue or other endemic flaviviruses

SUBGROUP – ZIKA VIRUS INFECTION, NON-CONGENITAL

Same as Zika Virus Disease, Non-Congenital, EXCEPT that neonate DOES NOT MEET clinical criteria for non-congenital disease.

3 LABORATORY TESTING

Testing is recommended if you have symptoms of Zika and have traveled to a country with a current Zika outbreak. In the event a country reports an outbreak of Zika virus, follow the testing guidance in MMWR: Dengue and Zika virus diagnostic testing for patients with a clinically

compatible illness and risk for infection with both viruses. Given the current global arboviral epidemiological situation, CDC has updated its Zika and dengue testing guidance for persons with recent travel to areas with active dengue transmission and a risk of Zika (purple area).

Laboratory diagnosis for Zika is based primarily on molecular methods and serologic tests.

a. Nucleic acid testing (NAT) testing, including RT-PCR (PCR) can be performed on serum, urine, cerebral spinal fluid, amniotic fluid, and placental/cord tissue. PCR should be performed on serum and urine ideally collected during the first two weeks after symptom onset. A positive PCR test result confirms Zika virus infection. However, because Zika virus RNA decreases over time, a negative PCR result does not rule out Zika virus infection.
b. Serologic assays can be used to detect Zika virus-specific IgM and neutralizing antibodies, which typically develop toward the end of the first week of illness and last for about 12 weeks. Due to cross-reaction with other flaviviruses and possible nonspecific reactivity, IgM results may be difficult to interpret.
c. Consequently, presumed positive and equivocal serological and PCR tests performed at the NJDOH Public Health and Environmental Laboratories (PHEL) must be forwarded to CDC for confirmation by plaque-reduction neutralization testing (PRNT). However, neutralizing antibodies may yield cross-reactive results in a person who was previously infected with another flavivirus, such as dengue or who has been vaccinated against yellow fever or Japanese encephalitis. For congenital cases, PRNT is needed for either the mother's OR the infant's specimen. PRNT includes IgG antibodies, which cross the placenta.

Laboratory testing for Zika (PCR and serology) is available at many commercial laboratories. For testing at NJDOH PHEL, current testing recommendations include:

1. Asymptomatic pregnant women:

- For asymptomatic pregnant persons living in or with recent travel to the U.S. and its territories, routine Zika virus testing is NOT currently recommended.
- For asymptomatic pregnant women with recent travel to an area with risk of Zika (purple areas) outside the U.S. and its territories, Zika virus testing is NOT routinely recommended, but NAAT testing may still be considered up to 12 weeks after travel.
    - Zika virus serologic testing is NOT recommended for asymptomatic pregnant women.
    - Zika IgM antibodies can persist for months to years following infection. Therefore, detecting Zika IgM antibodies might not indicate a recent infection.
    - There is notable cross-reactivity between dengue IgM and Zika IgM antibodies in serologic tests.

2. Symptomatic pregnant women:

- For symptomatic pregnant women who had recent travel to areas with active dengue transmission and a risk of Zika, specimens should be collected as soon as possible after the onset of symptoms up to 12 weeks after symptom onset.
    - The following diagnostic testing should be performed at the same time:

        - Dengue and Zika virus NAAT testing on a serum specimen, and Zika virus NAAT on a urine specimen, AND
        - IgM testing for dengue only.
    - Zika virus IgM testing is NOT recommended for symptomatic pregnant women.
        - Zika IgM antibodies can persist for months to years following infection. Therefore, detecting Zika IgM antibodies might not indicate a recent infection.
        - There is notable cross-reactivity between dengue IgM and Zika IgM antibodies in serologic tests. Antibodies generated by a recent dengue virus infection can cause the Zika IgM to be falsely positive.
    - If the Zika NAAT is positive on a single specimen, the Zika NAAT should be repeated on newly extracted RNA from the same specimen to rule out false-positive NAAT results. If the dengue NAAT is positive, this provides adequate evidence of a dengue infection and no further testing is indicated.
    - If the IgM antibody test for dengue is positive, this is adequate evidence of a dengue infection and no further testing is indicated.

3. For symptomatic pregnant women who have had sex with someone who lives in or recently traveled to areas with a risk of Zika, specimens should be collected as soon as possible after the onset of symptoms up to 12 weeks after symptom onset.

- Only Zika NAAT should be performed.
- If the Zika NAAT is positive on a single specimen, the Zika NAAT should be repeated on newly extracted RNA from the same specimen to rule out false-positive NAAT results.

4. Pregnant women who have a fetus with prenatal ultrasound findings consistent with congenital Zika virus infection who live in or traveled to areas with a risk of Zika during her pregnancy:

- Zika virus NAAT and IgM testing should be performed on maternal serum and NAAT on maternal urine.
- If the Zika virus NAATs are negative and the IgM is positive, confirmatory PRNTs should be performed against Zika and dengue.
- If amniocentesis is being performed as part of clinical care, Zika virus NAAT testing of amniocentesis specimens should also be performed and results interpreted within the context of the limitations of amniotic fluid testing. It is unknown how sensitive or specific RNA NAAT testing of amniotic fluid is for congenital Zika virus infection or what proportion of infants born after infection will have abnormalities.
- Testing of placental and fetal tissues may also be considered (see guidance for Collecting and Submitting Specimens at Time of Birth for Zika virus Testing.

5. Symptomatic non-pregnant patients:

- Clinicians should refer to testing guidance for dengue. Zika testing is NOT currently recommended for this group based on the current epidemiology of these viruses.

6. Infants born to mothers with Zika:

- Laboratory testing for congenital Zika virus infection is recommended for infants born to mothers with laboratory evidence of Zika virus infection during pregnancy, and for infants who have abnormal clinical findings suggestive of congenital Zika virus syndrome and a maternal epidemiologic link suggesting possible transmission, regardless of maternal Zika virus test results.

4 PURPOSE OF SURVEILLANCE AND REPORTING

- To identify imported cases and better understand the epidemiology of endemic and epidemic Zika virus disease and infection
- To ensure that cases are appropriately contained and prevent the introduction of virus into native mosquito populations
- To identify locally acquired cases, if they occur, so that appropriate active surveillance and mosquito control interventions can be taken
- To provide travelers with appropriate preventive health information

5 CASE INVESTIGATION

A. Investigation

It is important to investigate Zika cases in a timely manner to identify the source of exposure (travel, sexual, congenital, blood transfusion, suspected local mosquito transmission), to determine pregnancy status, and to provide patient education. Key education messages include protecting against mosquito bites for 3 weeks after return from travel, preventing sexual transmission, practicing safe sex during pregnancy, and observing recommended timeframes before attempting conception. The NJDOH Mosquito-borne Disease "Track When You're Back" flyer can assist LHDs with patient education

Case investigation should be initiated upon notification of a positive PCR or IgM laboratory test result. When only a positive IgM test result is available, it should be considered a presumptive positive result, that may not be confirmed by PRNT.

A Zika Patient Information Worksheet is available online to aid in the collection of required information needed to approve test requests and/or investigate a case of Zika. LHDs should contact the healthcare provider and obtain the information listed on the "NJDOH Zika Virus Patient Information Worksheet." LHDs should also interview the patient to provide education and to ask about ill household members with Zika-compatible symptoms and whether they have a similar travel history or sexual exposure. Family members with Zika symptoms in the absence of travel or sexual exposure may indicate local mosquito transmission. Ill household members should be referred to their healthcare provider for Zika testing. LHDs should contact the case patient again 14-21 days after symptom onset (or after return from travel) to confirm symptom status of household members. LHDs should notify CDS if it is determined that household members have Zika compatible illness in the absence of travel/sexual exposure in an endemic area.

LHDs should notify CDS if the suspected route of exposure is through blood transfusion, organ transplant, laboratory exposure, suspected local transmission, or other novel route.

B. Zika testing approvals

The following tests are available through PHEL and/or regional public health laboratories:

- PHEL:
  - Trioplex Real-time Reverse-Transcript Polymerase Chain Reaction (RT-PCR) assay which tests for Zika, dengue, and chikungunya
  - Zika IgM Antibody Capture Enzyme-Linked Immunosorbent Assay (MAC-ELISA)
  - Dengue IgM Antibody Capture Enzyme-Linked Immunosorbent Assay (MAC-ELISA)
- CDC:
  - PRNT: Plaque Reduction Neutralization Test
  - Maternal tissue testing (placenta/cord) is available at CDC for persons meeting testing criteria with pre-approval from CDS. Placental/fetal tissue and amniotic fluid testing is only available upon consultation with CDS (Phone: 609-826-5964 or e-mail CDS.ZikaTeam@doh.nj.gov).

Criteria for testing at PHEL:

- Symptomatic pregnant women who develop symptoms of Zika within 2 weeks of last exposure. Zika compatible symptoms include fever, rash, joint pain, and conjunctivitis. Note: specimens should be collected within 2 weeks of illness onset.
- Pregnant women with fetal abnormalities suggestive of congenital Zika syndrome detected on ultrasound and instances of fetal loss or infant death where mother had Zika exposure.
- Infants born to mothers with laboratory evidence of Zika virus infection, or infants with abnormalities suggestive of congenital Zika syndrome for whom there are maternal risk factors.
- For asymptomatic pregnant women with recent travel to an area with risk of Zika (purple area on Zika Travel Recommendation Map) outside the U.S. and its territories, routine Zika testing is NOT routinely recommended.
- In the event a country reports an outbreak of Zika virus (red area on Zika Travel Recommendation Map), clinicians should follow the testing guidance in the June 2019 MMWR: Dengue and Zika virus diagnostic testing for patients with a clinically compatible illness and risk for infection with both viruses.

Procedure to request public health testing at PHEL:

- Zika testing is now widely available at most commercial laboratories. If extenuating circumstances exist and patient cannot obtain commercial testing, the providers should fax a completed Zika Patient Information Worksheet to the local health department where the patient resides. Persons tested at PHEL must meet current Criteria for Obtaining Zika Virus Testing. If the patient meets eligibility criteria, the LHD will provide a specimen submission form (SRD-1) and specimen collection instructions (PHEL Technical bulletin) to the provider.
    - If the patient meets NJDOH testing criteria, LHDs should enter the case into CDRSS (selecting the appropriate subgroup) and complete an SRD-1 form. Notes on completing the SRD-1 form:
        - CDS Case Number: "NJZ + CDRSS Case ID#", for example NJZ1234567
        - Symptom Onset Date: "N/A" if asymptomatic
        - Pertinent Clinical Information (specimens may not be tested if the following information is not provided):
            - Pregnancy status (include EDD – estimated date of delivery and if fetal abnormalities are reported)
            - Asymptomatic or symptomatic (list symptoms if applicable)
            - Travel location and dates
            - Sexual exposure and dates of first and last unprotected sexual contact (include sexual partner's travel location and dates).
            - Previous arboviral infection (including Zika) and vaccination history
        - Tests Requested: Check the appropriate box.
- For newborn testing at the time of delivery: Birthing hospitals should refer to the NJDOH Zika Delivery Packet for recommended assessments and/or testing requests. The packet can

be found on the NJDOH Zika web page on the "Resources & References" sidebar under the heading "Pregnant Women and Infants.

C. Zika Deliveries

Infants born to mothers with Zika infection or with a Zika exposure (but who weren't tested) should be identified and screened for Congenital Zika Syndrome at delivery. Guidelines for birthing facilities is available in the "NJDOH Zika Delivery Packet". If testing is indicated, once the healthcare facility submits the required maternal and/or infant Zika Delivery Testing Forms to NJDOH, CDS will work with the hospital for specimen collection and shipping. If contacted by a pediatrician concerning an infant born to a mother exposed to Zika, but who is not in CDRSS, LHDs should notify CDS.

D. Key CDRSS Fields Specific for Zika

CDRSS Screen	Required Information
Patient Info	Based on presence of symptoms and whether case is congenital, select the appropriate subgroup: Zika virus disease, congenital; Zika virus infection, congenital; Zika virus disease, non-congenital; Zika virus infection, non-congenital
Clinical Information	For pregnant women, enter the following information: • Pregnancy Status, including Estimated Delivery Date and a check in the "Current Pregnancy" box • Delivery Site – choose the medical facility name if known
Risk Factors	All risk factors are important, but *most importantly* – • Travel history o For persons who traveled to a Zika affected area, select "Is there a history of travel?" ▪ List country in "Attribute" column and travel dates in the "Effective Dates" column o If patient relocated from a Zika affected area to the US/NJ, select "Relocated to US from area with known disease transmission ▪ List country in "Attribute" column and arrival date in the second "Effective Dates" field • Sexual exposure o For unprotected sexual exposures, select "Sexual Transmission" ▪ List date of earliest (if known) and latest unprotected sexual exposures in the "Effective Dates" column (**"ongoing" is not sufficient to assess testing eligibility.** Ask physician/patient to estimate date if necessary. o Also select "Sexual Partner's Travel" and provide the country and dates of the sexual partner's travel • Prenatal exposure o If patient was exposed during pregnancy, also select "Exposed during pregnancy or 8 weeks preconception" and note country or "sexual exposure" in "Attribute" column • Document if patient received a blood transfusion or organ transplant in 30 days prior to symptom onset – enter location and dates
Signs/ Symptoms	Signs/symptoms are tailored to each subgroup. Add additional symptoms and laboratory findings if applicable.

CDRSS Screen	Required Information
Contact Tracing	• Used to link infants born to mothers with Zika exposure during pregnancy or if a household/community cluster of cases is identified
Comments	• Document if patient has ongoing unprotected sexual contact with a Zika-exposed partner • Document if the patient had a previous arboviral diagnosis (including Zika[6]) – if so, enter disease and approximate date • Document if the patient was previously vaccinated against another flavivirus (e.g., YFV, JEV) and enter approximate date • Document date (14-21 days after onset or last exposure) patient was asked if household members have compatible symptoms; list the symptoms; the household member's travel/sexual exposures; and whether they have seen or will see a healthcare provider for Zika testing • Document if the patient was tested for dengue, noting the date, type (IgM, IgG, NAAT, PRNT), and result of the testing (positive, negative, pending results, etc); include Dengue case ID # if applicable.
Case Classification	• When entering cases as part of Zika testing approval, the case status should be "REPORT UNDER INVESTIGATION" • Once final laboratory results are received (e.g., PRNT results following a positive IgM) and household contacts have been assessed for symptoms of Zika, LHDs should close cases according to the case definition

6 CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

There are no isolation or quarantine requirements. However, to prevent transmission of Zika virus into the local mosquito population, persons with Zika should be advised to protect themselves from mosquito bites for 1 week after symptom onset. The local health department should instruct patients regarding this precaution. Additionally, because many infections are asymptomatic, it is recommended that anyone in New Jersey who has traveled from an area of widespread Zika transmission should avoid mosquito bites for 3 weeks after return.

B. Protection of Contacts

There are no restrictions of contacts.

[6] Additional Zika testing is not indicated if the patient has a previous "confirmed" diagnosis of Zika

Refer to the section below, titled “Preventative Measures: Sexual Transmission” for sexual transmission precautions.

While possible Zika virus infections have been identified in breastfeeding babies, current evidence suggests that the benefits of breastfeeding outweigh the risk of Zika virus spreading through breast milk. CDC continues to encourage mothers to breastfeed, even if they were infected or lived in or traveled to an area with risk of Zika.

C. Managing Special Situations

Locally-Acquired Case

A locally acquired case of Zika would be an unusual occurrence, as the *A. aegypti* mosquito is not well-established in New Jersey. If a local health officer determines during the course of an investigation that a patient does not have a travel or sexual exposure, s/he should notify NJDOH/CDS at CDSVectorTeam@doh.nj.gov. In collaboration with state and county mosquito control agencies, environmental and vector-control efforts to locate the source of infection and active surveillance for additional cases may be necessary. It is particularly important to ask about ill household members and their travel/sexual exposure history as part of routine case investigation.

Congenitally Acquired Case

Healthcare providers who identify an infant or child with birth defects or abnormalities potentially associated with prenatal Zika virus exposure should contact NJDOH Special Child Health and Early Intervention Services at 609-292-5676.

D. Preventive Measures

There is no vaccine to prevent Zika. Preventing mosquito bites and taking precautions against sexual transmission is key to reducing risk.

Mosquito Transmission

Key to prevention is avoiding mosquito bites if you live in or travel to an endemic area. Tips to prevent mosquito bites are available at http://www.nj.gov/health/cd/topics/vectorborne.shtml. If local mosquito transmission is suspected, CDS will partner with the New Jersey Department of Environmental Protection (DEP) on vector surveillance and control.

Domestic Travel

There is no current local transmission of Zika virus in the continental United States, including Florida and Texas, which reported local transmission of Zika virus by mosquitoes in 2016-17. Additional information for on domestic Zika transmission can be found on CDC's Zika in the US website: https://www.cdc.gov/zika/geo/index.html.

International Travel

Because epidemics of Zika can be extensive and may affect a high percentage of the population, travelers should avoid areas with ongoing epidemics. CDC recommends that pregnant women avoid travel to any area with a risk of Zika infection. However, for those who do travel to endemic areas, it is recommended that –

- Travelers protect themselves from mosquitoes by using insect repellents, wearing protective clothing, and using mosquito nets when rooms are not screened. Unlike other vectors, the *A. aegypti* mosquitoes bite during daytime hours, and these mosquitoes like to bite inside as well as around homes.

- Recent travelers to endemic countries with acute onset of fever and other compatible symptoms should seek medical attention immediately.

- Travelers to countries with mosquito-borne diseases should take extra precautions to avoid mosquito bites for 3 weeks after return, to prevent transmission to mosquitoes in NJ, which might go on to bite others in the household or nearby area, possibly spreading the disease.

Additional information for travelers to international destinations and US territories can be found on CDC's Zika Travel Information website: https://wwwnc.cdc.gov/travel/page/zika-information

Sexual Transmission

- Pregnant couples traveling to an area with a Zika outbreak or to an area with current or past Zika transmission or living in an area with risk of Zika should avoid unprotected sexual contact with a partner exposed to Zika by abstaining from sexual activity or using condoms for the duration of pregnancy every time they have sex (oral, vaginal or anal). Couples should not share sex toys throughout the pregnancy.

- Couples who are trying to or interested in becoming pregnant should consider waiting to get pregnant if you travel to or live in an area with risk of Zika and discuss their plans for pregnancy with a healthcare provider to determine their risk and the options available

- Couples Who Are Not Pregnant and Not Trying to Become Pregnant Traveling to an area with risk of Zika should consider using condoms every time they have sex or not have sex while traveling. Anyone who is not pregnant or trying to get pregnant should consider taking precautions against sexual transmission because nearly half of pregnancies (45%) in the United States are unintended. If either partner develops symptoms of Zika or has concerns, they should talk to a healthcare provider.
    - Couples living in an area with risk of Zika can use condoms or not have sex if they are concerned with passing or getting Zika through sex.
    - If a couple has a male partner and only the male partner travels to an area with risk of Zika, the couple should consider using condoms or not having sex for at least 3 months.
    - If a couple has a female partner and only the female partner traveled to an area with risk of Zika, the couple should consider using condoms or not having sex for at least 2 months.
    - If the couple contains both a male and female partner and both travel to an area with risk of Zika, the couple should consider using condoms or not having sex for at least 3 months.
    - Couples living in an area with risk of Zika can use condoms or not have sex if they are concerned with passing or getting Zika through sex.
- Additional Resources:

    - CDC's Guidelines for the Prevention of Sexually Transmitted Zika virus infections: https://www.cdc.gov/zika/prevention/sexual-transmission-prevention.html

    - CDC's Interim Guidance for Preconception Counseling and Prevention of Sexual Transmission of Zika Virus for Men with Possible Zika Virus Exposure: https://www.cdc.gov/mmwr/volumes/67/wr/mm6731e2.htm?s_cid=mm6731e2_w

    - CDC's Women and Their Partners Trying to Become Pregnant: https://www.cdc.gov/pregnancy/zika/women-and-their-partners.html

    - CDC's Pregnant Women and Zika: https://www.cdc.gov/pregnancy/zika/protect-yourself.html

If you are caring for a person with Zika

- Take steps to protect yourself from exposure to the person's blood and body fluids (urine, stool, vomit).

E. Treatment

There are no specific medications to treat a Zika infection. If you think you may have or had Zika, tell your doctor or healthcare provider.

Additional Information

NJDOH: http://nj.gov/health/cd/zika/
CDC: www.cdc.gov/zika

References

Centers for Disease Control and Prevention, Key Messages – Zika Virus Disease. https://www.cdc.gov/zika/pdfs/Zika-Key-Messages.pdf.

Centers for Disease Control and Prevention, MMWR Vital Signs: Update on Zika Virus-Associated Birth Defects and Evaluation of All U.S. Infants with Congenital Zika Virus Exposure-U.S. Zika Pregnancy Registry, 2016. April 7, 2017, https://www.cdc.gov/mmwr/volumes/66/wr/mm6613e1.htm?s_cid=mm6613e1_w

Centers for Disease Control and Prevention, MMWR Interim Guidance for Interpretation of Zika Virus Antibody Test Results. May 31, 2016, https://www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6521e1.pdf.

Centers for Disease Control and Prevention, MMWR Zika Virus Transmission — Region of the Americas, May 15, 2015–December 15, 2016. March 31, 2017 / 66(12);329–334: https://www.cdc.gov/mmwr/volumes/66/wr/mm6612a4.htm.

Duffy M et al. Zika Virus Outbreak on Yap Island, Federated States of Micronesia. New England Journal of Medicine, 2009; 36: 2536-2543.

Freddy A Medina, Giselle Torres, Jenny Acevedo, Sharon Fonseca, Leslie Casiano, Carlos M De León-Rodríguez, Gilberto A Santiago, Katherine Doyle, Tyler M Sharp, Luisa I Alvarado, Gabriela Paz-Bailey, Jorge L Muñoz-Jordán, Duration of the Presence of Infectious Zika Virus in Semen and Serum, The Journal of Infectious Diseases, Volume 219, Issue 1, 1 January 2019, Pages 31–40, https://doi.org/10.1093/infdis/jiy462

Krow-Lucal ER, Biggerstaff BJ, Staples EJ. Emerging Infectious Diseases, Vol 23 No. 5., May 2017. Estimated Incubation Period for Zika Virus Disease. https://wwwnc.cdc.gov/eid/article/23/5/pdfs/16-1715.pdf

Luisa Barzon, Elena Percivalle, Monia Pacenti, Francesca Rovida, Maurizio Zavattoni, Paola Del Bravo, Anna Maria Cattelan, Giorgio Palù, Fausto Baldanti, Virus and Antibody Dynamics in Travelers With Acute Zika Virus Infection, Clinical Infectious Diseases, Volume 66, Issue 8, 15 April 2018, Pages 1173–1180, https://doi.org/10.1093/cid/cix967

Polen KD, Gilboa SM, Hills S, et al. Update: Interim Guidance for Preconception Counseling and Prevention of Sexual Transmission of Zika Virus for Men with Possible Zika Virus Exposure — United States, August 2018. MMWR Morb Mortal Wkly Rep 2018;67:868-871. DOI: http://dx.doi.org/10.15585/mmwr.mm6731e2.

Sharp TM, Fischer M, Muñoz-Jordán JL, et al. Dengue and Zika Virus Diagnostic Testing for Patients with a Clinically Compatible Illness and Risk for Infection with Both Viruses. MMWR Recomm Rep 2019;68(No. RR-1):1–10. DOI: http://dx.doi.org/10.15585/mmwr.rr6801a1.

Paz-Bailey G, Rosenberg ES, Doyle K, et al. Persistence of Zika Virus in Body Fluids – Final Report. New England Journal of Medicine2018; 379:1234-1243.

Sotelo JR, Sotela AB, Soleto FJ, et al. Emerging Infectious Diseases, Vol 23 No. 5., May 2017. Persistence of Zika Virus in Breast Milk after Infection in Late Stage Pregnancy. https://wwwnc.cdc.gov/eid/article/23/5/16-1538_article